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A NEW SPECIES OF GASTROTRICHAN—*CHAETONOTUS ROBUSTUS*, NEW SPECIES

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In the summer of 1926, the writer found a worm, apparently undescribed, but obviously referable to the genus *Chaetonotus* among the Gastrotricha, in material collected in a woodland swamp near Bedford, Westchester County, New York. In July of the year 1937, a similar individual was discovered in material gathered from a small woodland pool in the Great Swamp near Chatham, Morris County, New Jersey; and the latter specimen has been taken as the type of a new species, for which the name *Chaetonotus robustus* is proposed.

Subsequent investigation at the last-mentioned locality soon brought to light four additional living specimens, along with a dead, but well-preserved individual and fragmental remains of another. All the foregoing material, including the type specimen, has been turned over to The American Museum of Natural History.

One striking feature of *Chaetonotus robustus* is its size. Extended individuals attain a length (exclusive of the anterior sensory tufts) of 585–615 microns (type specimen 601 microns); even contracted and enrolled individuals measure 389–435 microns, their bulkiness rendering them objects just visible to the naked eye. The largest species of *Chaetonotus*, as the genus is now defined (Remane 1935), is *Chaetonotus simrothi* Voigt (427 microns).

Figure 1 represents the general appearance of the new species in a moderately extended condition. When fully extended, its shape becomes even more strap-like, presenting only slight variations in width (maximum width of type specimen 110 microns, at a point two-thirds distant from the anterior end).

The width of the head is approximately 95 microns; its anterior margin rounded, five-lobed by virtue of low-arched, closely applied plates—the posterior lobes in a greatly reduced condition, however. Anterior and lateral sensory tufts both present, composed of short, fine hairs.

In fully extended individuals a slightly constricted neck region is sometimes evident.

The posterior third of the body narrows to a width equal to about two-thirds that of the head and terminates in a pair of rather widely separated, backwardly directed caudal processes, comprising short conical bases and slender extensions that curve ventrally and slightly toward each other and end in minute, abruptly-pointed tips. The length of the caudal processes, exclusive of their bases, is 47 microns. Slight swellings project from the undersides of the extensions just behind their junctures with the conical bases (Fig. 4), but annulated features of any sort are lacking. The bases—or at least the greater parts of them—are smooth surfaced, without scales or bristles. Several of the latter, however, appear on adjacent parts of the body proper, rather long ones arising from the region lying between the caudal processes.

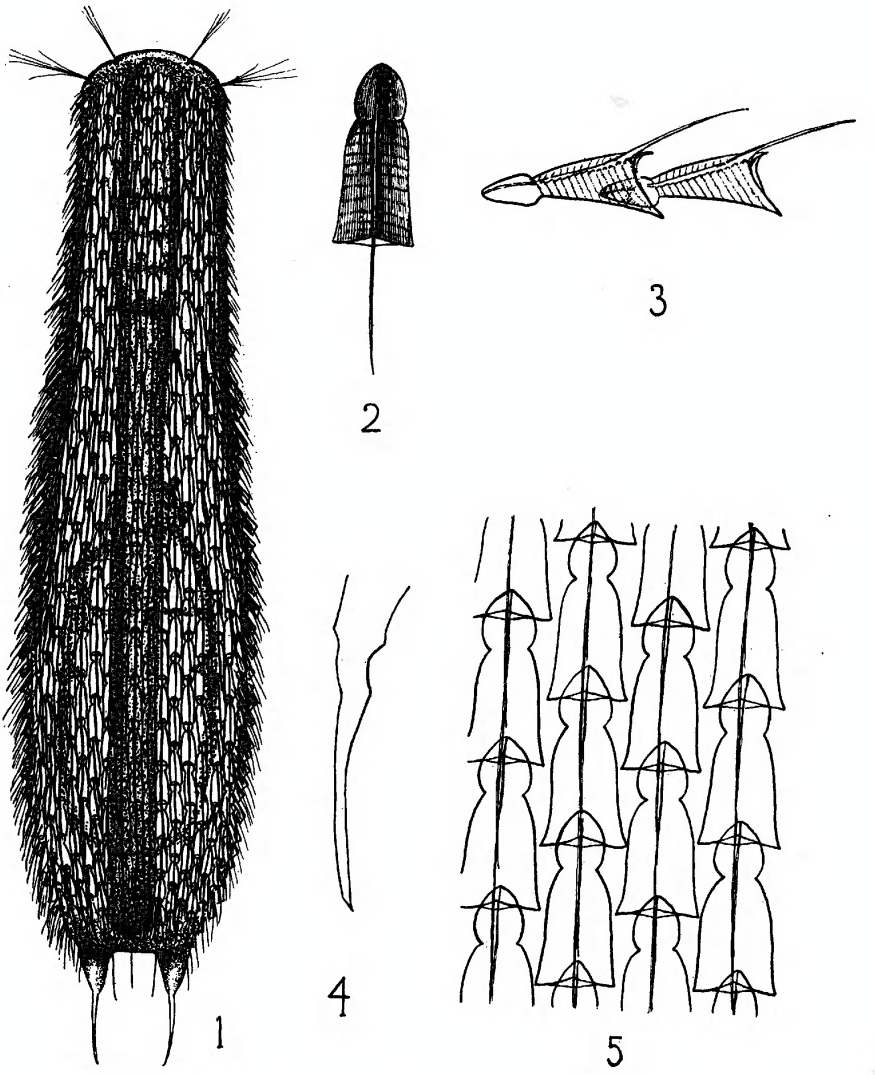
The entire dorsal surface of the body, together with its sides and apparently a considerable portion of its ventral surface, is thickly covered with scales, bearing simple, backwardly directed spines.

The scales conform to the general type of dermal appendage found in the genus *Chaetonotus* (bearing perhaps the closest resemblance to certain body scales of *Chaetonotus elegans* Konsuloff), but seem to be larger and more elaborate than any heretofore described for members of that group (Fig. 2).

They consist essentially of flat, rounded bases closely applied to the cuticle, with long, pouch-like extensions (each composed of two divergent laminae), freely projecting from their posterior edges. The spines are recumbent for considerable distances, forming conspicuous median ridges on the dorsal surfaces of the scales. The freely extending portions of the spines are slightly arched and taper to fine points.

Scales occurring on different parts of the body appear to differ in little other than size and relative proportions. Those of the type specimen furnished the following measurements. Scales from the head region: total length (exclusive of spines) 20 microns; maximum width 6 microns; length of free portion of spine $16^1/_2$ microns. Scales from the posterior region of the body: length $32^1/_2$ microns; width 16 microns; spine 29 microns. These figures are fairly representative of the dimensions of the scales in other specimens (smallest head scale $14^1/_2$ microns long with a spine extending 13 microns further; largest body scale 36 microns with a spine 25 microns). The length of the base (included in the total length measurements given above) in all cases was about 11 microns; its width was practically the same (10–$12^1/_2$ microns).

The largeness of these scales brings to light structural features that



Chaetonotus robustus, new species.

Fig. 1. General appearance, dorsal view, × 211. Fig. 2. Body scale, dorsal view, × 692. Fig. 3. Body scales in situ, lateral view, × 692. Fig. 4. Left caudal process, lateral view, × 718. Fig. 5. Diagrammatic representation of arrangement of scales, dorsal view, × 692.

do not seem to be recorded for the scales of related species, namely, 10–12 evenly spaced transverse ridges on the dorsal laminae (which probably denote lines of growth), and 30 or more exceedingly fine, longitudinal striae running down the entire dorsal surface of the scale. The latter features were also observed on the ventral laminae. In the writer's opinion, they are to be interpreted as the lines of demarcation of agglutinated cilia. If this is correct, they determine the phylogenetic derivation of the dermal appendages of the group.

The scales are arranged in compact, longitudinal rows, with the scales in alternate rows lying at corresponding levels (Fig. 5). At least 20 such rows are visible simultaneously at the widest part of the body of a moderately contracted individual.

As already noted, only the rounded bases of the scales are attached to the cuticle; and, as the juncture of the base with the rest of the scale is flexible, the posterior portion, with its spine, may be, and frequently is, bent almost perpendicularly to it and to the surface of the body. This is seen on an extensive scale when the animal rolls up, the tautness of the cuticle evidently contributing to that effect.

Usually, however, the scales, when viewed from the side, present the appearance shown in Fig. 3. They overlap to a slight extent, but the ends of the spines extend so far as to overlie the recumbent portions of succeeding spines, making them appear confluent in the dorsal aspect (Fig. 5). The number of scales in any one row is from 20 to 26. The rows apparently end just short of the caudal processes.

On anaesthetization and at death, the animal invariably rolls up, a circumstance that prevented detailed observation of the heavily ciliated tracts on the ventral surface of the body.

Under ordinary magnification, the mouth appears to be provided with a circlet of stout setae; but that of one of the preserved specimens, under high magnification, is seen to be surrounded by 15 or more soft linguiform processes, with the same type of finely striated surface, as are to be found on the scales. These are features that call for further investigation.

When the body is fully extended, the pharynx is about 125 microns in length and the intestine around 400 microns. The former is of fairly uniform width, although sometimes displaying transverse folds. In the type specimen, the ovary, overlying the intestine, contained several immature eggs. The heavy dermal covering of the animal makes study of its internal organs difficult.

Algae are at least one of its dietary constituents; for the intestine

of the dead specimen contained a stout *Closterium* 220 microns in length and another attenuate *Closterium*, that was 474 microns long. The latter extended through the intestine into the pharynx and served to keep the animal in an extended condition (585 microns). Unfortunately the algae were expelled by the increased pressure occasioned by the lowering of the cover-glass; whereupon the body at once contracted and rolled up.

A word as to the ecological conditions of the two stations in which *Chaetonotus robustus* was found.

Both were undrained, shady bogs, filled with decaying leaves and fringed with Sphagnum, with a floating mat of Lemna and other aquatic vegetation in the deeper parts. *Ricciella fluitans* was also present in abundance at the New York locality. The fauna in each instance included such Protozoa as *Pelomyxa villosa*, *Difflugia pyriformis* and *Difflugia acuminata*, *Lecquereusia modesta*, *Metopus sigmoides*, *Spirostomum ambiguum* and *Spirostomum teres*, *Caenomorpha medusula*, *Stentor polymorphus*, *Menoidium pellucidum* and *Distigma proteus*. Nematodes and oligochaetes (*Stylaria* and *Dero*) were also present. Among the Gastrotricha found at the New Jersey station may be mentioned *Polymerurus rhomboides* Stokes, *Dasydytes saltitans* Stokes, *Dasydytes bisetosus* Thompson, *Aspidiophorus paradoxus* Voigt, *Polymerurus nodicaudus* Voigt and *Stylochaeta fusiformis* Spencer, the four last species not having heretofore been reported from North America.

Two of the specimens of the new worm were taken from tangled vegetation at the top of the collecting bottle, but all others came from the bottom detritus, where the above-mentioned elements of the fauna were especially prevalent. Probably most of the progress of *Chaetonotus robustus* is accomplished by creeping, for no swimming individuals were observed.

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